

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of

Revitalization of the AM Radio Service

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) **MB Docket No. 13-249**
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COMMENTS On SECOND FURTHER NOTICE OF RULEMAKING

By Edward A. Schober, PE, Radiotechniques Engineering, LLC, Zip2, LLC, Winchester Radio Broadcasters, LLC

1. The engineering consulting firm of Radiotechniques Engineering, LLC, Winchester Radio Broadcasters, LLC and Zip-2, LLC hereby submit these comments in response to the Commission's Second Further Notice of Proposed Rulemaking ("2nd FNPRM") that was issued in the above-captioned proceeding on October 5, 2018. In the Notice, the Commission solicited comments on its various specific proposals that are listed topically herein.

2. Edward A. Schober, is a licensed professional engineer employed by Radiotechniques Engineering LLC, a New Jersey limited liability company that provides engineering services to broadcasting stations. He has engineered hundreds of AM station upgrades, modifications and applications for new stations. He is also a member in Winchester Radio Broadcasters, LLC, owner of WXVA(AM), Winchester, VA, and is a member of Zip2, LLC, Licensee of WKGE, Johnstown, PA and holder of a construction permit holder for WXPB, a new AM station in Enola, PA. He is also the licensee and permittee of several FM Translators. Mr. Schober has over thirty-nine years experience in advising thousands of broadcast radio station clients in areas of RF engineering, station design, FCC technical representation and propagation studies. Mr Schober is a member of the AFCCE, and a senior life member of the IEEE and senior member of the SBE. Mr Schober's contact information is:

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3. The Commission in FCC 118-139 requested comments on specific proposals to amend the FCC rules to relieve restrictions on AM stations, and to adjust regulations to compensate for the increased noise level in the medium wave band, particularly related to skywave protection of Class A AM stations. Mr Schober and the affiliated companies agrees with all of the rule changes that are specifically proposed in the 2nd FNPRN for the reasons that were provided in our previously filed Commentsⁱ. We include these comments by reference. Additional information that we believe may be significant is presented in these comments also.

4. Revision of section 73.21 is proposed to eliminate protection of Class A secondary service. The secondary service area is an anachronism in all but Alaska. The noise level in populated areas is well above 0.5 mV/m so these signals are largely unusable. Long distance truck drivers had been a substantial portion of the audience for skywave AM broadcasting, however the implementation of electronic control systems in diesel trucks has made reception of even strong AM signals impossible. The audience in long haul trucking has completely switched to satellite and G4 wireless streaming. We believe that elimination of protection to AM the secondary service area as proposed would be a boon to the industry, and supports the Commission's proposal.

1. The Commission seeks comments on the effect on IPAWS and PEP operation of Class A stations in furtherance of emergency notification. In the context of nuclear attack, AM radio station skywave service will not exist, as the D layer ionosphere will be sufficiently excited to block all skywave signals. Delivery of emergency alerts and messages to final distribution points by fiber optic cable is much less subject to the effects of EMP than the large antennas, power lines and transmitters of AM stations. In the case of other emergencies, such as hurricanes, tsunamis, earthquakes, etc. Class A AM Radio Stations is much less valuable in wide area alerts than previously. The most critical information and alerts are local in nature, with things like shelter locations, evacuation orders, tornado paths, etc. covering areas that are adequately served by groundwave service. There are now multiple methods of distributing wide area alerts to radio stations, including satellite, the internet, NOAA weather stations, Part 90 and land mobile radio, FM stations and broadcast and cable TV station audio channels. Even by groundwave, Class A AM stations often serve areas much larger than the effected area of a disaster. As such, they are no longer critical to delivery of post incident messages, or program delivery to other broadcast facilities.
2. The night groundwave protected contour of CONUS Class A stations should be protected. Our original comments proposed using single signal analysis, and not be subject to RSS limitation. Upon considering the proposals of Carl T Jones Corp. (CTJ) and those of duTriel, Lundin and Rackley (dLR) and Hatfield and Dawson (H&D), Mr. Schober recognizes a much greater benefit to the dLR approach:
 1. The CTJ approach (Alternative 1 of the 2nd FNPRM) provides only administrative convenience. It is easy to derive the location of the Class A station's 0.5 mV/m groundwave contour, and determine that the proposal's 0.025 mV/m 10% skywave contour does not overlap it. The CTJ proposal in nearly every case overprotects the actual

nighttime groundwave coverage of Class A stations. Aside from the interference consideration, it has been determined elsewhere in this proceeding that even the 0.5 mV/m contour is inadequate for acceptable service except in rural areas, and then not within vehicles, homes or workplaces due to electrical noise at those locations.

2. The dLR and H&D proposals (Alternative 2 of the 2nd FNPRM) are slightly more complicated, and are much more accurate, while retaining administrative certainty, and assurance of protection to actual usable service. These similar proposals provide, for most Class A stations, protection that is more than adequate for today's noise environment. With regard to nighttime protection of class A stations. We recommend Alternative 2 (dLR and H&D) of the 2nd FPPRM, with some specific caveats to assure for successful and meaningful protection of the nighttime groundwave service of class A stations:
 1. An addition should be made to the FCC database in its conversion from CDBS to the new LMS system. Currently CDBS has no data field containing information concerning the status of foreign records. For the 47 clear channels on which US Class A stations operate, and their first adjacent channels, the FCC should populate and maintain in the database, a field containing the international status (pending, objected, accepted, etc) of those foreign stations which might enter the NIF of the class A stations. This could be accomplished for all foreign stations and proposals which produce a 0.025 mV/m 10% skywave contour on these channels over the United States. This will permit automatic allocation studies and avoid multiple communications to the International Branch to determine the status of those international allocations and whether they should be considered in establishing the RSS of the domestic Class A station to be protected.
 2. Since many of the Class A stations are on first adjacent channels to other Class A stations, they enter the Nighttime RSS of another Class A station to be protected. The first adjacent protection ratio of 2:1 should be reviewed at this time, as other sections of this proceeding propose that this protection ratio be revised to 1:1 for all stations. This must be resolved at least for Class A stations in this proposed action, as it will substantially effect the calculation of the Nighttime RSS of Class A stations. If the dLR proposal is adopted, this protection ratio should be established with certainty as domestic adjacent channel Class A stations enter the night limit of several other Class A stations. A change in required protection ratio to first adjacent channel Class A AM stations could significantly change the nighttime protected contour of those stations.
 3. For similar reasons, the RSS exclusion method of determining the protected contour and the maximum permitted signal for Class A skywave protection should use the 50% exclusion method. The 25% exclusion method complicates the calculation and seriously limits the potential new night service to Class B and Class D stations seeking to institute or improve night service. The 25% exclusion method has produced no benefit to the AM service.

4. **Site to site analysis for determination of the Night Interference Free contour** of the Class A station protected is a simplifying assumption that should be utilized to avoid unnecessary complication for the design of proposals and simplicity of analysis by the FCC. When the Class A station is sufficiently distant, perhaps 2000 km, it may be acceptable to use site to site analysis to determine protection but because of the large class A groundwave service area, contour map or clipping point analysis using the transmitter site NIF is needed to assure adequate protection. The dLR proposal was not completely clear on its proposal in this matter, but the Class A Night Interference Free value at the transmitter site is certainly adequate to determine the protected contour. Analyzing the NIF at the individual clipping points provides little value in most cases, however this analysis could be optionally permitted in applications, but not to rebut uniform NIF assumptions for the station made by site to site NIF calculation.
 5. The cost and complexity of building a directional antenna system that protects both Cochannel and Adjacent Channel class A stations is very substantial. Leaving the skywave first adjacent protection ratio undecided will inhibit stations from implementing changes in their night operations because of the uncertainty of more permissive limitations in the future. Additionally, where the 2:1 protection causes an increase in the night limit of a Class A station from an adjacent channel Class A station, it may leave that cochannel station underprotected from improvements to other stations in the interim. (Mr. Schober's comments on first adjacent protection issues are already part of the record). We believe that a reduction of the first adjacent protection ratio to 1:1 should be contingent on eliminating AM Hybrid HD operation. Full digital HD or DRM operation is fully compatible with a 1:1 first adjacent protection ratio.
3. We agree in principle with FCC Proposal to change the RSS calculation methodology for reasons of given in our previous comments. We generally agree with the dLR proposal to use site to site calculations for Class B first adjacent channel skywave protection, and for all cochannel Class B stations except where the site to site NIF contour of the protected stations subtends 10 degrees or less of azimuth from the proposed station, not including long salt water path signals.
1. We had originally proposed an alternate daytime protected contour of 1 mV/m for class B, C and D stations, and had also proposed changing the protection ratios. The dLR proposal appears to be a rational alternative to the FCC proposal, and to ours. We believe that the combination of increasing the daytime protected contour to 2.0 mV/m, and establishing a co-channel interfering contour at 0.05 mV/m and first adjacent channel interfering contour at 1.0 mV/m aligns with the goals we proposed in our initial comments. In the case that the FCC does not intend to de-authorize AM Hybrid HD operation, it is important to maintain an adequate first adjacent channel protection ratio. The dLR proposal meets our concerns as it provides a 6 db margin of protection in the case that the FCC decides that it is inadvisable to prohibit further operation of AM Hybrid HD.

2. If protection of Class A station skywave coverage is to be eliminated, there is no logic to continuing to exclude Class B and Class D stations from PSRA and PSSA authorizations. Section 73.99 should be modified to correspond.
 1. Subparagraph (b)(1) should be modified to have “ Class D” become “Class B and Class D” and have “Mexican, Bahamian and Canadian priority” deleted and an additional sentence, “Protection is to be provided to the 0.5 mV/m groundwave signals of co-channel U.S. Class A stations.”; paragraph (b)(2) and (3) should be deleted and subparagraph (4) renumbered.
 2. Subparagraph (d) should be similarly modified.
 3. Subparagraph (f)(1) should have “foreign” inserted before the words “Class A station” and after the words “ not produced” add “and for Domestic Class A stations,”
 4. Subparagraph (f)(3) should be deleted. It is duplicative of Subparagraph (b)(1) and (f)(1)
2. We believe that while either proposal is reasonable and will provide adequate protection of Class A station’s nighttime groundwave service, the CTJ proposal provides only administrative convenience, while the dLR proposal will, in most cases, provide much greater new night service opportunities for existing cochannel class B and D stations while still fully protecting all Class A usable groundwave service. This requires a modest additional information to the FCC database to avoid burdensome FCC internal and external of international allocations and stations.
2. With regard to critical hours protection, we recommend Alternative 2 of the 2nd FNPRM.

The Commission proposes to remove paragraph (h) of Section 73.24, critical hours protection of Class A Stations. Mr. Schober reiterates his original comments that the present regulation is very counterproductive. Simple elimination of the rule may not be ideal, at certain times AM stations can cause severe “daytime skywave” interference. The simple fact is, however, every ten or eleven years, for two or three years, the sun is quiet. A quiet sun plays havoc in mornings and afternoons on many AM stations. When the original rules were formulated, Stations on regional channels were limited to 5 kW, a power level unlikely to cause daytime skywave interference to other Class B and D stations. When the power levels for class B and D stations were increased, it was discovered that in the 2007-2010 period of low solar flux the high power Class B and D facilities often caused destructive interference to cochannel Class B and D stations. Generally, however only when the smoothed solar flux is below 70-80 sfu is there any potential for daytime skywave interference. In any case, the present critical hours protection of domestic and Canadian class A stations is overkill by almost an order of magnitude.

If the Commission chooses to retain Critical Hours protection of Class A stations, the following modifications to the rule should be made:

- Modify the analysis for all stations to protect the revised section 0.5 mV/m groundwave service contour, or the transmitter site (It should not make much difference) and commensurately increase the permitted field intensity by 5. (to recognize the stronger protected contour).
- Continue grandfathering of existing critical hours radiation levels.
- Codify the curves to an equation.
- Require critical hours protection only when the monthly smoothed solar flux decreases below 75 sfu. The FCC should specify the NOAA or Canadian source for the solar flux report. ie. During most months a high power station directed at a relatively nearby cochannel station would be permitted to operate during “critical hours” at full daytime facilities, and only have to reduce power during months with low solar flux.
- This will assure protection of effected station’s important drive time programming, while avoiding unnecessary power reduction / restrictive directional antenna use for hundreds of AM stations. Under this proposed revision, the majority of AM stations with critical hours modes will no longer require power reduction or separate directional authorizations, but those which have a high potential for interference will have to decrease power only when required, but under a regime much less restrictive than present. The number of stations which would still have critical hours authorization would reduce from hundreds to dozens, and their critical hours radiation would be substantially increased.
- It should be noted that the disruptive low solar flux period that was expected this year has not materialized, so it may be over ten years before the sunspot cycle will cause actual critical hours interference to distant stations.

4. The FCC has requested comment on the costs and benefits to alternative approaches to addressing the issues raised in the record. We offer the following:

1. Class A AM stations gain nothing in the proposed rule revisions. This is cold comfort for the most profitable class of AM stations. We believe that the single largest gain available for Class A stations would be to raise the maximum daytime power to 100 kW. This is permitted under all international agreements except the US- Canada bilateral agreement, and would permit Class A stations to gain as much as a 3 db advantage over the ever increasing noise level. Canada has virtually abandoned the AM band, and should permit this exception on a case by case basis. This higher power would be permitted for Class A stations more than 1050 km from the Canadian border without Canadian concurrence. For many class A stations the capital investment may be modest, as many stations have auxiliary transmitters, and it is easy to combine two transmitters for the increased power. This would allow class A stations, where allocations permit, to have a level of improvement, including KFAQ, KFI, KNBR, KNX, KNZR, KOAI, KOKC, KRLD, KWKH, WBAP and WWL. For Class A stations closer to Canada, permit 100 kW provided 0.025 mV/m extends no further into Canada except 1070 and

1130 kHz when the 0.005 mV/m contour would extend into Canada no further than with 50 kW.

2. Convert all Expanded Band class B stations to the same standards as other Class B stations. Allow minor changes to 50 kW, and directional antennas, provided full protection of other stations is afforded under the rules presently pertaining to 550-1600 kHz band.
3. We proposed many other changes to the allocations rules. Most of these afford similar merit in improvements to the AM broadcast service. We request that the FCC move promptly on adopting the other measures.

5. **Conclusion:** We believe that the FCC should move forward promptly with the proposed changes as outlined above:

- Adopt alternative 2 of the of the 2nd FPPRM with respect to skywave protection of Class A stations.
 - Add international acceptance data to all international station records in the FCC database that could impact the RSS of US Class A stations.
 - Utilize site to site 50% calculations to determine protected contour.
 - Utilize site to site calculations for Class A stations greater than 2000 km.
 - Utilize contour or clipping studies based on transmitter site NIF if closer than 2000 km
 - Utilize 50% exclusion method for all Class A calculations.
- Adopt alternative 2 of the 2nd FPPRM with respect to critical hours protection of Class A stations.
 - Protect based upon the transmitter site, or upon the location of points on the 0.5 mV/m
 - Consider requiring Critical Hours operation only to months when the smoothed solar flux decreases below 75 sfu.
- Consider modifying station class Definitions
 - Class A daytime power to 100 kW for stations further than 1050 km from Canada, and by special negotiation when closer than that.
 - Convert expanded band stations to 540 – 1600 kHz band standards.
 - Permit maximum Class D night power of 1 kW
 - Permit Class C stations to convert to Class D

We agree that there is a thorough set of comments and reply comments by experienced engineers on record in this rulemaking for the FCC to act. These comments support the conclusion of dLR that there is a clear path to properly improving the state of AM Broadcasting in the United States, and Schober, Winchester Radio Broadcasters, LLC and Zip2, LLC fully support their conclusions. We believe that the dLR proposal for daytime protection provides by far the best compromise between the various proposals, and that the record is clear enough to proceed on the record as it stands. We offer minor

adjustments and comments on the proposals they provided, along with some minor clarifications of our previous proposals resulting in increased day power limitations that will avoid certain Classes of station to losing out on the ability to improve their station facilities.

Respectfully Submitted,

A handwritten signature in blue ink that reads "Edward A. Schober". The signature is written in a cursive style with a large, stylized 'E' and 'S'.

Edward A. Schober, PE

i Comments on rulemaking